

## Data General Nova Series New Product Announcement

Important recent additions to the Data General Nova Series include the CS/40 family of packaged business data processing systems and the Business BASIC programming language.

CS/40: The Commercial Systems CS/40 line can be adequately described as a series of packaged Nova 3/12 systems equipped with automatic program loader, power monitor/auto restart, battery backup unit, new commercial firmware, a new operating system, and a new COBOL language capability. The CS/40 line is aimed at two primary markets: operational departments and subsidiaries of "Fortune 2000" companies, and OEM's configuring turnkey systems for first-time users with business volumes in the \$500,000 to \$20 million range.

The three models that presently constitute the CS/40 family differ in memory size, number of CRT's supported, and the version of the COBOL compiler employed. Mod C1 supports 32K words of NMOS parity memory, one Dasher CRT display/keyboard, and Single-User Interactive COBOL; Mod 3 supports 32K words of NMOS parity memory, one to four Dasher CRT display/keyboards, and Multi-User (disc swapping) Interactive COBOL; and Mod C5 supports 64K words of NMOS parity memory, one to nine Dasher CRT display/keyboards, and Multi-User (memory mapping) Interactive COBOL.

Each of the CS/40 models is capable of supporting one printer, selected from a 300-lpm line printer, a 165-cps serial printer, or a 60-cps Dasher terminal printer; one magnetic tape drive; up to four 10-megabyte cartridge disc drives; a synchronous communications interface; and up to two single or dual diskette drives. If one diskette drive is configured in a CS/40 system, total system disc capacity is reduced to 30 megabytes. It is further reduced to 20 megabytes if a dual diskette drive is configured.

Specific submodels of the Mod C1, C3, and C5 designate packaging with a particular printer, as shown in the accompanying price list. All CS/40 systems are packaged with the same central processing unit, a 10-megabyte cartridge disc subsystem, a Dasher CRT display/keyboard, a single diskette drive, a 57-inch-high office cabinet, and a license to use a version of Interactive COBOL.

The Interactive COBOL compiler used with the CS/40 systems is not the same compiler currently found on the Data General Eclipse Systems. The compiler is a full ANSI 1974 Level 2 implementation, while CS/40 COBOL is essentially a Level 1 implementation of ANSI 1974 with Level 2 extensions. Specifically, Interactive COBOL implements the Nucleus, Table Handling, Sequential, Relative, Indexed Sequential (ISAM), and Library modules at Level 1. Level 2 capabilities are included in several modules; e.g., numeric identifier sign conditions are permitted; complex conditions such as AND, OR, NOT, and parentheses are allowed; the standard 96-character ASCII set is supported; floating-point data formats are supported; for structured programming, nested IF statements and the PERFORM verb with the UNTIL condition clause are supported; and for use with international currency, CURRENCY SIGN IS and DECIMAL POINT IS COMMA are supported.

The Data Division of Interactive COBOL contains a Screen Section for entry and inquiry/response formats. Syntactically, screen interaction is allowed via the ACCEPT and DISPLAY verbs in the Procedure Division. Program-defined screen formats are displayed at full intensity, while entered data is displayed at half intensity.

The EXCLUSIVE OPEN, READ. . . WITH LOCK and UNLOCK facility provides a means for a program employing ISAM to deny file access by another program. This procedure prevents two programs from simultaneously trying to change the same record on a file. Both relative and indexed sequential access provide file and record lockout under program control. Record lockout is not available in the Mod C1 version of COBOL. ISAM under Interactive COBOL allows keys up to 100 bytes long and records up to 4096 bytes long.

Interactive COBOL operates under the CS/40 operating system, an adaptation of Data General's well known Real-Time Disc Operating System (RDOS). Both the Mod C1 and C3 systems rely on disc swapping techniques for program management, while the Mod C5 employs memory management.

The RJE 80 Remote Job Entry control program lets CS/40 systems perform remote job entry tasks and communicate with other Data General computers and IBM-compatible systems. RJE 80 supports four types of remote job entry systems: point-to-point communications between a CS/40 system emulating an IBM 2780 or 3780 terminal and an IBM-compatible host system; point-to-point communications between two Data General computers running RJE 80; multidrop Data General systems emulating 3780 slave terminals communicating with an IBM-compatible host; and multidrop Data General systems emulating 3780 slave terminals communicating with a Data General system also running RJE 80.

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Users who currently have a Nova 3/12 can upgrade to a CS/40. The cost will vary widely, depending on the present Nova 3/12 configuration, as shown in the price list that follows. The first CS/40 system must be purchased with the Interactive COBOL Service Package. This package includes on-site systems engineering installation, one training credit for Interactive COBOL, and one year's software subscription service.

A typical CS/40 Mod C1 includes a Nova 3/12 with 32K words of 700-nanosecond NMOS parity memory, a 6053 Dasher 1920-character CRT display/keyboard, a 6045 10-megabyte cartridge disc subsystem in a cabinet, a 6031-B single diskette drive, a 6041 receive-only 60-cps Dasher terminal printer, an 1131 32-by-54 inch worktable, and an 1130-A 57-inch single-bay cabinet. Purchase price is \$33,415 with a monthly maintenance charge of \$340. A typical CS/40 Mod C3 adds two 1131 worktables and two 6053 Dasher CRT display/keyboards to the Mod C1 configuration. Purchase price is \$40,245 with a monthly maintenance charge of \$380.

A typical CS/40 Mod C5 includes a Nova 3/12 with memory management unit and 64K words of 700-nanosecond NMOS parity memory; five 6053 Dasher 1920-character CRT display/keyboards; a 6045 10-megabyte cartridge disc subsystem in a cabinet; a 6031-B single diskette drive, a 9121-A subsystem with a 1130-A single-bay cabinet; a 6021 magnetic tape subsystem (9-track, 75-ips, 800-bpi); a 6050 add-on 10-megabyte cartridge disc drive; a 9125 300-lpm line printer subsystem; a 9127 synchronous line interface for Bell 202-type modem; five 1131 worktables; and an 1130-B dual cabinet. Purchase is \$82,100 with a monthly maintenance charge of \$787. (The 9125 printer subsystem is the same printer as the 4218 listed in the Nova Equipment prices but with a programmed I/O feature added.)

**BUSINESS BASIC:** Data General's new Business BASIC language was developed as a spin-off of the still-viable RDOS Extended BASIC and can be run under RDOS or Mapped RDOS. Mapped RDOS users can run Business BASIC as a time-sharing system in one partition while concurrently running a batch, time-sharing, or real-time job in the second partition. Portions of the Business BASIC language system and utilities were obtained from Technical Analysis Corporation, of Atlanta, Georgia.

Extensions to BASIC for business applications in multiple-terminal environments include a multiple-keyed indexed sequential file access method, dynamic record allocation, six-character variable names, common area, direct block I/O, and commercial string functions. Business BASIC uses double-precision integer arithmetic, maintaining accuracy to  $\pm 21,474,836.47$  and eliminating the rounding problem of floating-point arithmetic. Print formatting statements allow output strings to be left or right justified, filled with a character, or truncated. They also handle decimal points, fixed and floating signs, and zero suppression.

Business BASIC provides access to standard RDOS sequential, random, and contiguous files, but also provides its own multiple-keyed indexed sequential file structure for keyed data access. Each ISAM index is a separate, balanced tree-structured file, and multiple indices may have access to the same data file. Data records can be allocated to disk dynamically. Both index and data files have lock and unlock protection. Record lockout provides file integrity when files are accessible by multiple users.

Business BASIC has an optional interface to the Infos data management system for use with commercial Eclipse systems. Files created with this interface are compatible with Infos ISAM and DBAM files created by COBOL, RPG II, FORTRAN IV, FORTRAN 5, and the Idea data entry software.

Program development features include the RENUMBER statement for the entire program, the RENUM statement for specific line numbers, and the VAR statement for a sorted listing of all variables used in a program.

An attach and de-attach facility lets a user start a job at a terminal and then de-attach it to run independently of any terminal, so that the user can work on other programs at the same terminal. For file maintenance, Business BASIC statements allow files to be sorted on disk and allow editing of ASCII text files. The file maintenance package also supports simultaneous creation, modification, and accessing of files by multiple users. A set of utility programs is provided to simplify program development and aid documentation. System security is maintained by statements that can prevent users from accidentally accessing Business BASIC at the monitor level.

The minimum equipment configuration required for Business BASIC under Data General's program license agreement is any Nova or Eclipse computer licensed to run RDOS, with 64K bytes of read/write memory, any Data General terminal, a real-time clock, and 10 megabytes of disk storage.

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**DOS BASIC:** Although not a new product for the Nova, DOS BASIC documentation was not available at the time the preceding report, M11-304-301, was written. We deem the product important enough to describe it here. DOS BASIC is a subset of RDOS Extended Basic and is upward-compatible with both RDOS and AOS Extended BASIC. The interpreter takes advantage of operating system features by supporting device independence, and features extensions to Dartmouth BASIC. These features include string arithmetic, matrix operations, user-controlled output formatting, and sequential, random, and contiguous file management. DOS BASIC also offers several program development features and an assembly-language interface that allows subroutine calls. Both single- and multi-user versions of DOS BASIC have been released by Data General.

The minimum hardware configuration for single-user DOS BASIC is any Nova computer with 16K words of main memory, a dual diskette drive and controller, a real-time clock, and one terminal with the appropriate interface. The minimum hardware configuration for multi-user DOS BASIC is any Nova with 32K words of main memory, a dual diskette drive and controller, a real-time clock, and two terminals with appropriate interfaces. Additionally, a wide variety of peripherals can be supported on a Nova-based DOS BASIC system, including diskette drives, magnetic tape drives, line printer, paper tape reader and punch, plotter, and multiple terminals. A maximum of 32K words of main memory can be supported. □

### EQUIPMENT PRICES

		<u>Purchase Price</u>	<u>Monthly Maint.</u>	<u>5-Year Lease*</u>
<b>PACKAGED SYSTEMS</b>				
All CS/40 systems include a Nova 3/12 with commercial firmware for Interactive COBOL, MOS parity memory, auto program load, power monitor/auto restart, battery backup unit, a 10-megabyte cartridge disc subsystem, a single-drive diskette unit, a 57-inch cabinet, a Dasher display CRT terminal, and the license to use a version of Interactive COBOL.				
	Mod C1; includes 32K words of memory and the license for Single-User Interactive COBOL:			
9131	With 60-cps RO Dasher printer	\$32,915	\$340	\$1,081
9132	With 165-cps serial matrix printer	37,690	364	1,212
9133	With 300-lpm line printer	42,590	384	1,343
	Mod C3; includes 32K words of memory and the license for Multi-User Interactive COBOL:			
9134	With 60-cps RO Dasher printer	34,165	340	1,109
9135	With 165-cps serial matrix printer	38,940	364	1,241
9136	With 300-lpm line printer	43,840	384	1,371
	Mod C5; includes 64K words of memory and the license for Multi-Terminal Interactive COBOL:			
9137	With 165-cps RO Dasher printer	46,240	428	1,469
9138	With 300-lpm line printer	51,140	448	1,599
913XU	Mod C1 to Mod C3 upgrade; includes a Dasher CRT and license to use Multi-User (disc-swapping) Interactive COBOL. Requires a copy of software and documentation. X is 1, 2, or 3	3,990	20	—
913YU	Mod C3 to Mod C5 upgrade; includes 32K words of memory, MAP, and license to use Multi-User (memory mapping) Interactive COBOL. Requires a copy of software and documentation, and either a 165-cps or 300-lpm printer. Y is 4, 5, or 6	9,950	106	—
<b>PACKAGED MAGNETIC PERIPHERALS FOR CS/40 SYSTEMS</b>				
9120	6021 Magnetic Tape Subsystem with single-bay cabinet; 9-track, 75-ips, 800-bpi, vacuum column transport with controller	11,050	90	339
9121-A	Magnetic Tape and Disc Subsystem; includes 9120 Subsystem and a 6050 10-megabyte add-on Cartridge Disc Drive	19,200	170	602
9121-B	With two 6050 Drives and a second add-on cabinet bay	28,500	250	891
9121-C	With three 6050 Drives and a second add-on	36,650	330	1,155
9124-A	6050 Add-on 10-megabyte Cartridge Disc Drive and cabinet bay	9,300	80	289
9124-B	With two drives	17,450	160	553
9124-C	With three drives and two cabinet bays	27,750	240	865
<b>MASS STORAGE</b>				
6050	10-megabyte add-on Cartridge Disc Drive and one removable disc cartridge	9,000	80	283
6031-B	Add-on Single Floppy Disc Drive; for systems with three or fewer cartridge disc drives	2,400	35	89
6030-B	Add-on Dual Floppy Disc Drive; for systems with one or two cartridge disc drives	3,400	40	117
1121B	Disc cartridge	200	—	—
1121A	Six Disc Cartridges	960	—	—
1098A	Box of 10 Diskettes	120	—	—
<b>MAGNETIC TAPE EQUIPMENT</b>				
6021	Magnetic Tape Subsystem; 9-track, 75-ips, 800-bpi, vacuum column transport and controller	9,900	90	313
119-36	Reel of Magnetic Tape; 2400 feet	36	—	—
119-40	Reel of Magnetic Tape; 600 feet	20	—	—
119-44	Reel of Magnetic Tape; 400 feet	12	—	—

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<b>PRINTERS</b>				
9125	4218 Line Printer Subsystem with switch-selectable top of form feature; 300 lpm, 136 columns, 64 char. set drum printer and controller	12,300	74	351
9126	4034D Serial Matrix Printer with top of form feature and 4034 Controller; 115 cps, 7 x 9 dot matrix, 64-char. set	7,400	54	221
6041-F	RO Dasher printer with serial asynchronous interface; 60 cps, 5 x 7 dot matrix	2,450	26	81
1129	Top of form option	175	4	8
<b>TERMINALS</b>				
	Dasher CRT; 24 lines by 80 characters, 5 x 8 dot matrix, 96-char. set; additional features such as blink and underscore			
6053-G	With current loop interface	2,290	52	72
6053-F	With EIA interface	2,290	52	72
9123	Expansion module for attachment of the sixth to ninth Dasher CRT to a Mod C5	6,800	53	206
<b>COMMUNICATIONS</b>				
9127	Synchronous Line Interface for Bell 202-type modem and license to use Interactive COBOL/RJE80 software	2,500	15	72
<b>HARDWARE</b>				
1130-A	Single-bay, 57-inch cabinet	1,150	—	26
1130-B	Double-bay, 57-inch cabinet	2,300	—	52
1131	Worktable; 32 x 54 inches	500	—	11

\*Monthly lease prices are based on a finance factor of 0.0225 in effect 5/17/77; maintenance prices have been added for the reader's convenience.

**SOFTWARE PRICES**

Interactive COBOL Services Package includes on-site systems engineering installation, one training credit for Interactive COBOL, one year's Software Subscription Service, and one copy of Interactive COBOL and Documentation.

Software listed below is available on 800-bpi magnetic tape (M), 1600-bpi magnetic tape (H) or diskette (F)

3712-50M or F	Services Package for Mod C1	\$1,500
3713-50M or F	For Mod C3	2,000
3714-50M or F	For Mod C5	2,000
3715-20M or F	Interactive COBOL/RJE80	100
	Software upgrade from Nova 3/12 to CS/40 Mod 1	5,500
	Additional copies	3,500
3709-00M, F or H	Business BASIC with on-site installation, one training credit, and one year of the software subscription service	4,000
3709-10	Additional license for second system	1,800
3709-20M or H	Additional copies without supporting services	100
3709-20F	Additional copies without supporting services	125
3710-02 M or H	Infos interface with software subscription service	1,000
3710-10	Additional license for second system	800
3710-20M or H	Additional copies without supporting services	100
3596-01F	Single-User DOS BASIC	1,000
3597-01F	Multi-User DOS BASIC	1,000